

WHAT IS CLAIMED IS:

5 1. A voice mail service system for a private switching system, comprising:  
a system matching circuit configured to couple to a private switching  
system, so as to interface all information in relation to a call and a management of the call;  
a voice data memory to provide a voice mail function, and to store voice  
guide information in an address sector of a corresponding channel after compressing the  
voice guide information;  
a voice and signal processor to store voice data of the extension subscriber  
in the voice data memory and retrieve it so that the voice data can be transmitted;  
a communication controller to manage a state of each channel matching  
with the private switching system, process channel errors, and maintain and repair the  
channel; and  
a control circuit to match with the private switching system to control an  
operation for maintaining the voice mail function.

10 2. The system of claim 1, wherein the voice mail service system is a line card,  
configured to couple to the private switching system.

3. The system of claim 2, wherein the line card accommodates a prescribed number of extension subscribers, and wherein an increase in a number of line cards can increase a number of extension subscribers capable of being served with the voice mail service.

4. The system of claim 1, wherein the system matching circuit comprises:  
an interface section to interface with the private switching system;  
a buffer to store data transmitted to and received from the private switching system in a prescribed protocol; and  
a common memory to store call-related messages and data transmitted or received between the private switching system and the control circuit.

5. The system of claim 1, wherein the voice data memory has a prescribed storage capacity, which is configured to be expanded by a unit of memory bank.

6. The system of claim 1, wherein the voice and signal processor comprises:  
a vocoder coupled to the private switching system through a PCM highway  
and a system interface bus, configured to compress and modulate PCM voice signals;  
a first high speed RAM to store an algorithm for a compression-modulation  
and a demodulation of the PCM voice signals by the vocoder;

a first buffer to store the PCM voice signal compressed and modulated by the vocoder and the PCM voice signal outputted;

a first dual port RAM to maintain a smooth transmission and a smooth reception of the compressed and modulated PCM voice signal, to be stored in the voice data memory and the PCM voice signal outputted; and

a first interface circuit coupled to the vocoder and the first dual port RAM, so as to arbitrate and control occupations of system interface bus by the vocoder and the first dual port RAM.

7. The system of claim 6, wherein the voice and signal processor further comprises:

a Dual Tone Multi-Frequency (DTMF) processor to process and analyze DTMF signals received from a terminal of the extension subscriber or a caller side terminal;

a second high speed RAM to store an algorithm for an operation of the DTMF processor;

a second buffer to temporarily store analyzed DTMF signals;

a second dual port RAM to prevent a collision between the analyzed DTMF signals and the DTMF signals; and

a second interface circuit coupled to the DTMF processor section and the second dual port RAM, to arbitrate and control the occupation of a system interface bus.

8. The system of claim 7, wherein the first and the second dual port RAMs respectively comprise banks of memory, each of which store voice data to provide the voice mail service and a registration for the voice mail service.

9. The system of claim 7, wherein data transmission/reception between the vocoder and the DTMF processor is carried out through the PCM highway, and is controlled by the control circuit.

10. The system of claim 6, wherein the first and the second dual port RAMs respectively comprise banks of memory, each of which store voice data to provide the voice mail service and a registration for the voice mail service.

11. The system of claim 6, wherein data transmission/reception between the vocoder and the DTMF processor is carried out through the PCM highway, and is controlled by the control circuit.

12. The system of claim 1, wherein the voice and signal processor further comprises:

a Dual Tone Multi-Frequency (DTMF) processor to process and analyze DTMF signals received from a terminal of the extension subscriber or a caller side terminal;

a high speed RAM to store an algorithm for an operation of the DTMF processor;

a buffer to temporarily store analyzed DTMF signals;

a dual port RAM to prevent a collision between the analyzed DTMF signals and the DTMF signals; and

a interface circuit coupled to the DTMF processor section and the dual port RAM, to arbitrate and control the occupation of a system interface bus.

13. The system of claim 1, wherein the voice memory provides the voice mail to each extension subscriber of the private switching system and stores voice guide information of the extension subscriber, and wherein the voice and signal processor stores voice data of the extension subscriber to transmit to an incoming caller.

14. The system of claim 2, wherein the connection to the private switching system is over a parallel bus.

112 2nd 15. The system of claim 4, wherein the private switching system is a system of higher rank than the voice mail system.

16. The system of claim 6, wherein the vocoder is coupled to the private switching network over a PCM highway and a system interface bus, and wherein the PCM voice signals are from an extension subscriber and are received over the PCM highway from the private switching system and are arranged for a recording in order to provide the voice mail service, the vocoder demodulating the compressed and modulated PCM voice signals to transmit the PCM voice signals to a caller side having applied an incoming call.

17. A method of providing a message service for a network system, comprising:  
setting a subscriber's message in a data memory;  
determining a busy or nonresponsive state of the subscriber in response to an incoming communication from a terminal;  
transferring the incoming communication to a system matching section;  
temporarily storing the subscriber's message in the system matching section;

providing automatic guide service to a control section;  
accessing data of the subscriber in the voice data memory by the control  
section;

10 providing the data and a control signal to a signal processor; and  
transmitting the subscriber's message to the terminal.

18. A line card for a private switching system, comprising:  
a voice and signal processor configured to store and transmit a voice signal  
through the private switching network to a caller; and  
an interface and control circuit coupled to the voice and signal processor,  
5 configured to exchange call information and data with a private network and control the  
line card, wherein the line card is configured to provide a voice mail service for the private  
switching system.

19. The system of claim 1, wherein the voice and signal processor compresses  
the voice data prior to it being stored, and decompresses the compressed voice data prior  
10 to it being transmitted.

20. The method of claim 17, wherein the data memory, the system matching section, the control section, and the signal processor comprise a line card for providing the message service for the network.

21. The method of claim 17, wherein the subscriber's message is compressed prior to being set in the data memory, and is decompressed prior to transmitting to the terminal.

22. The method of claim 17, wherein the network is a private switching system and the message is a voice message.

23. The method of claim 22, wherein the signal processor includes a voice processor, and the voice message is transmitted to the terminal through a vocoder.

24. The method of claim 23, wherein the voice message service is provided to the private switching system through a line card of the private switching system.